(11) **EP 1 350 938 A3**

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3: **08.03.2006 Bulletin 2006/10**

(51) Int Cl.: F02D 41/02^(2006.01) F02D 41/14^(2006.01)

F01N 3/20 (2006.01)

(43) Date of publication A2: **08.10.2003 Bulletin 2003/41**

(21) Application number: 03014459.6

(22) Date of filing: 17.04.1997

(84) Designated Contracting States: **DE FR GB**

(30) Priority: **17.04.1996 JP 9571096 22.04.1996 JP 12280396**

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC: 97302621.4 / 0 802 318

(71) Applicant: HONDA GIKEN KOGYO KABUSHIKI KAISHA
Minato-ku,
Tokyo (JP)

(72) Inventors:

Yano, Toru
1-4-1 Chuo,
Wako-shi,
Saitama-ken (JP)
Komoriya, Isao

1-4-1 Chuo, Wako-shi, Saitama-ken (JP) Yasui, Yuji
 1-4-1 Chuo,
 Wako-shi,
 Saitama-ken (JP)

 Yonekura, Takahiro 1-4-1 Chuo, Wako-shi, Saitama-ken (JP)

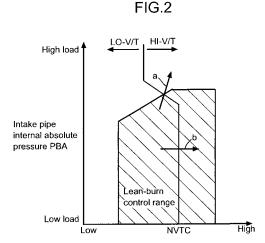
 Asano, Yutaka 1-4-1 Chuo, Wako-shi, Saitama-ken (JP)

Tatara, Yusuke
 1-4-1 Chuo,
 Wako-shi,
 Saitama-ken (JP)

(74) Representative: Tothill, John Paul Frank B. Dehn & Co.179 Queen Victoria Street London EC4V 4EL (GB)

(54) Control system and control process in an internal combustion engine

A control system for an internal combustion engine in which a valve timing is switched between a low-speed (LO-V/T) or high-speed (HI-V/T) valve timing within a lean-burn control range established in accordance with the operational state (an intake pipe internal absolute pressure (PBA) and an engine revolution number (Ne)) of the engine, wherein an air-fuel ratio of an air-fuel mixture supplied to the engine is enriched for a predetermined time when the valve timing is switched (b) from the low-speed valve timing to the high-speed valve timing while carrying out a lean-burn control. The ignition timing (θIG) may be changed from a value suitable for one valve timing to a value suitable for the other valve timing via an intermediate value. The air-fuel ratio may be enriched for a set period when going from a lean-burn or fuel-cut condition to a stoichiometric condition when there is a ternary catalyst in the exhaust.



Engine revolution number NE

EP 1 350 938 A3



EUROPEAN SEARCH REPORT

Application Number

EP 03 01 4459

Category	Citation of document with indication	n, where appropriate,	Relevant	CLASSIFICATION OF THE	
X	correlevant passages EP 0 581 279 A (TOYOTA KAISHA; TOYOTA MOTOR CO 2 February 1994 (1994-0 * column 2, line 10 - 1 * column 6, line 46 - c * claims 1,7-9; figures	LTD) 2-02) ine 39 * olumn 11, line 8 *	to claim	F02D41/02 F01N3/20 F02D41/14	
X	US 5 438 826 A (BLISCHK 8 August 1995 (1995-08- * column 1, line 57 - c * column 3, line 20 - c * column 5, line 24 - c	08) olumn 2, line 20 * olumn 4, line 33 *	1,2		
X	US 5 228 286 A (DEMURA 20 July 1993 (1993-07-2 * column 1, line 51 - c * column 6, line 1 - li * column 9, line 57 - c * claims *	0) olumn 3, line 38 * ne 24 *	1,2		
A	EP 0 585 900 A (TOYOTA KAISHA) 9 March 1994 (1 * column 1, line 45 - c * column 7, line 6 - co * column 12, line 46 - * column 14, line 51 - * claims 1,7,8; figures	994-03-09) olumn 2, line 21 * lumn 9, line 1 * column 14, line 3 * column 17, line 27	1,2	TECHNICAL FIELDS SEARCHED (IPC)	
	The present search report has been dra	·			
	Place of search The Hague	Date of completion of the search	Examiner Libeaut, L		
The Hague CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document		E : earlier patent docun after the filing date D : document cited in th L : document cited for c	T : theory or principle underlying the in E : earlier patent document, but publis		

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 03 01 4459

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

13-01-2006

US 5438826 A 08-08-1995 DE 4236922 A1 05-05-199 FR 2697584 A1 06-05-199 IT 1266628 B1 09-01-199 JP 3608809 B2 12-01-206 JP 6200803 A 19-07-199 US 5228286 A 20-07-1993 JP 3348434 B2 20-11-206 JP 4342847 A 30-11-199 EP 0585900 A 09-03-1994 DE 69301560 D1 28-03-199	US 5438826 A 08-08-1995 DE 4236922 A1 05-05-19 FR 2697584 A1 06-05-19 JP 3608809 B2 12-01-26 JP 6200803 A 19-07-19 US 5228286 A 20-07-1993 JP 3348434 B2 20-11-26 JP 4342847 A 30-11-19 EP 0585900 A 09-03-1994 DE 69301560 D1 28-03-19 DE 69301560 T2 19-09-19 JP 2692530 B2 17-12-19 JP 6129246 A 10-05-19	cited in search report		Publication date		Patent family member(s)	Publication date
FR 2697584 A1 06-05-199 IT 1266628 B1 09-01-199 JP 3608809 B2 12-01-200 JP 6200803 A 19-07-199 US 5228286 A 20-07-1993 JP 3348434 B2 20-11-200 JP 4342847 A 30-11-199 EP 0585900 A 09-03-1994 DE 69301560 D1 28-03-199	FR 2697584 A1 06-05-19 IT 1266628 B1 09-01-19 JP 3608809 B2 12-01-20 JP 6200803 A 19-07-19 US 5228286 A 20-07-1993 JP 3348434 B2 20-11-20 JP 4342847 A 30-11-19 EP 0585900 A 09-03-1994 DE 69301560 D1 28-03-19 DE 69301560 T2 19-09-19 JP 2692530 B2 17-12-19 JP 6129246 A 10-05-19	EP 0581279	A	02-02-1994	DE	69314866 T2	04-12-1997 12-03-1998 18-07-1995
JP 4342847 A 30-11-199 EP 0585900 A 09-03-1994 DE 69301560 D1 28-03-199	JP 4342847 A 30-11-19 EP 0585900 A 09-03-1994 DE 69301560 D1 28-03-19 DE 69301560 T2 19-09-19 JP 2692530 B2 17-12-19 JP 6129246 A 10-05-19	US 5438826	Α	08-08-1995	FR IT JP	2697584 A1 1266628 B1 3608809 B2	05-05-1994 06-05-1994 09-01-1997 12-01-2005 19-07-1994
	DE 69301560 T2 19-09-19 JP 2692530 B2 17-12-19 JP 6129246 A 10-05-19	US 5228286	Α	20-07-1993			20-11-2002 30-11-1992
JP 6129246 A 10-05-199		EP 0585900	A	09-03-1994	DE JP JP	69301560 T2 2692530 B2 6129246 A	28-03-1996 19-09-1996 17-12-1997 10-05-1994 13-06-1995

FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82